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Widget and Mobile Technologies a Forcing Function for Acquisition Change: Paradigm Shift Without Leaving Bodies Behind

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14. ABSTRACT
The Department of Defense (DoD) software acquisition policy struggles to adapt to the emerging trend of delivering lightweight applications on demand via application store technologies. The commercial world has evolved to where it now provides a constant stream of capabilities allowing customers to customize their information/communication devices with numerous applications. DoD-created solutions are often inflexibly designed with limited adaptability due to requirements for reliability, communications security, and absolute need for accuracy. Because of this, acquisition processes are needed that allow warfighters to take advantage of the rich Internet applications and Web 2.0 technologies currently available to the average consumer. This paper identifies processes for employing a DoD application store that delivers software in a rapid, secure, and reliable manner. Leveraging the government-developed open source Ozone Widget Framework, web applications are developed and registered to a single repository. The warfighter can discover, access, and compose these web applications from the Ozone Marketplace. To promote innovation and foster collaboration between the DoD and industry, the application stores in the DoD should include separate industry trial and demonstration sections. Industry partners can upload capabilities for demonstration/trial by the government and allow program offices to evaluate applications with the goal of selecting capabilities for Programs of Record.

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Preface & Acknowledgements

Welcome to our Ninth Annual Acquisition Research Symposium! This event is the highlight of the year for the Acquisition Research Program (ARP) here at the Naval Postgraduate School (NPS) because it showcases the findings of recently completed research projects—and that research activity has been prolific! Since the ARP's founding in 2003, over 800 original research reports have been added to the acquisition body of knowledge. We continue to add to that library, located online at www.acquisitionresearch.net, at a rate of roughly 140 reports per year. This activity has engaged researchers at over 60 universities and other institutions, greatly enhancing the diversity of thought brought to bear on the business activities of the DoD.

We generate this level of activity in three ways. First, we solicit research topics from academia and other institutions through an annual Broad Agency Announcement, sponsored by the USD(AT&L). Second, we issue an annual internal call for proposals to seek NPS faculty research supporting the interests of our program sponsors. Finally, we serve as a "broker" to market specific research topics identified by our sponsors to NPS graduate students. This three-pronged approach provides for a rich and broad diversity of scholarly rigor mixed with a good blend of practitioner experience in the field of acquisition. We are grateful to those of you who have contributed to our research program in the past and hope this symposium will spark even more participation.

We encourage you to be active participants at the symposium. Indeed, active participation has been the hallmark of previous symposia. We purposely limit attendance to 350 people to encourage just that. In addition, this forum is unique in its effort to bring scholars and practitioners together around acquisition research that is both relevant in application and rigorous in method. Seldom will you get the opportunity to interact with so many top DoD acquisition officials and acquisition researchers. We encourage dialogue both in the formal panel sessions and in the many opportunities we make available at meals, breaks, and the day-ending socials. Many of our researchers use these occasions to establish new teaming arrangements for future research work. In the words of one senior government official, "I would not miss this symposium for the world as it is the best forum I've found for catching up on acquisition issues and learning from the great presenters."

We expect affordability to be a major focus at this year's event. It is a central tenet of the DoD's Better Buying Power initiatives, and budget projections indicate it will continue to be important as the nation works its way out of the recession. This suggests that research with a focus on affordability will be of great interest to the DoD leadership in the year to come. Whether you're a practitioner or scholar, we invite you to participate in that research.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the ARP:

- Office of the Under Secretary of Defense (Acquisition, Technology, & Logistics)
- Director, Acquisition Career Management, ASN (RD&A)
- Program Executive Officer, SHIPS
- Commander, Naval Sea Systems Command
- Program Executive Officer, Integrated Warfare Systems
- Army Contracting Command, U.S. Army Materiel Command

- Office of the Assistant Secretary of the Air Force (Acquisition)
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- Director of Open Architecture, DASN (RDT&E)
- Program Executive Officer, Littoral Combat Ships

James B. Greene Jr.   Keith F. Snider, PhD
Rear Admiral, U.S. Navy (Ret.)   Associate Professor

Panel 20. Application of an App Store Software Model Within the DoD

Thursday, May 17, 2012	

1:45 p.m. – 3:15 p.m.	**Chair: Brigadier General Michael E. Williamson,** USA, Joint Program Executive Officer, Joint Tactical Radio System
	
	Joint and Coalition Tactical Networking: There's an App for That! Improving Affordability and Accelerating Innovation in Tactical Networking Using the Joint Tactical Radio System Enterprise Business Model
	
	    Jeffery Hoyle, *Joint Tactical Radio System*
	
	Widget and Mobile Technologies a Forcing Function for Acquisition Change: Paradigm Shift Without Leaving Bodies Behind
	
	    Michael Morris, Christopher Raney, Kenneth Trabue, Timothy Boyce, Kari Nip, *Space and Naval Warfare Systems Center Pacific*
	
	Apple App Store as a Business Model Supporting U.S. Navy Requirements
	
	    Douglas Brinkley and Brad Naegle
	    Naval Postgraduate School

Michael E. Williamson—General Williamson assumed his duties as joint program executive officer for the Joint Tactical Radio System in March 2011.

General Williamson was born in Tucson, AZ. He was commissioned at the University of Maine as a second lieutenant in the Air Defense Artillery in 1983.

His assignments include service as the automation officer for the 32nd AADCOM in Darmstadt, Germany. He then served as a chaparral platoon leader, vulcan platoon leader, maintenance officer, and executive officer in C Battery, 108th Brigade, Hahn Air Force Base, Germany. After attending the Air Defense Artillery Advance Course, he served as the chief, Forward Area Air Defense Weapons, Development Branch at Fort Bliss, TX. He then commanded B Battery, 3/1 ADA (Hawk) in the 11th Brigade at Fort Bliss and also in the 31st ADA Brigade at Fort Hood, TX. After completing command, he served as the Assistant S-3 in the 31st ADA Brigade.

His acquisition experience began as senior military software analyst at NATO's military headquarters in Mons, Belgium. He then served as the associate director, Battle Command Battle Lab at Fort Leavenworth, KS. After attending Command and General Staff College, he served as the chief of information technology, Acquisition Career Management, within the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. He was then selected as a congressional fellow and served as a legislative assistant to a member of Congress. After completing the fellowship, General Williamson served as the product manager for the Global Command and Control System-Army, and then as the acquisition military assistant to the Secretary of the Army. He served as commander of the Software Engineering Center-Belvoir (SEC-B). He was then assigned as the project manager, Future Combat System (Brigade Combat Team) Network Systems' Integration within program manager, Future Combat System (Brigade Combat Team). He then served as the director of systems integration, within the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. Prior to his current assignment, General Williamson served as the deputy program manager, Program Executive Office, Integration.

General Williamson's awards and decorations include the Legion of Merit with two Oak Leaf Clusters; the Meritorious Service Medal with two Oak Leaf Clusters; the Joint Service Commendation

Medal, the Army Commendation Medal with two Oak Leaf Clusters, the Joint Service Achievement Medal, the Army Achievement Medal with two Oak Leaf Clusters, the Army Superior Unit Award, the National Defense Service Medal with Bronze Star, the Global War on Terrorism Service Ribbon, the Army Service Ribbon, the Overseas Ribbon, and the Army Staff Identification Badge.

General Williamson's education includes a Bachelor of Science from Husson College in business administration, a Master of Science in systems management from the Naval Postgraduate School, and a PhD in business administration from Madison University. He also has graduate certificates in public policy from the JFK School of Government, Harvard University, and the Government Affairs Institute at Georgetown University. He is a graduate of the Army Command and General Staff College, a graduate of the Advanced Management Program at the Harvard Business School, and was a Senior Service College Fellow at the University of Texas at Austin. He is Level III certified in program management and communications and computers.

Widget and Mobile Technologies a Forcing Function for Acquisition Change: Paradigm Shift Without Leaving Bodies Behind

Michael Morris—Morris has 29 years of experience in C4I systems, including most recently working as lead systems engineer (LSE) for DoD/PEO C4I Marketplace efforts. He previously served as deputy project manager/LSE for the Collaborative Force Analysis Sustainment and Transportation at SSCPAC. Morris has also worked in the Test and Evaluation of Net-Enabled Command and Control, gaining extensive knowledge in service-oriented architectures. Additionally, he has extensive experience in Global Command and Control System-Maritime/Joint test plan development/procedures and reports. As COMSPAWARSYSCOM 04F Afloat test director (2000–2004), he was responsible for testing all SPAWAR products installed on U.S. Naval vessels. [michael.a.morris4@navy.mil]

Christopher Raney—Raney serves as the head of the Network-Centric Command Systems Branch at SSCPAC. A native of San Diego, CA, Raney graduated from San Diego State University (SDSU), summa cum laude, with a Bachelor and a Master of Science degree in computer science. Raney received the prestigious Outstanding Computer Science Graduate award, given to the top graduating computer science student at SDSU each year. Raney subsequently joined SSCPAC as a computer scientist. He has worked in a broad spectrum of areas, including net-centric systems, information assurance, cyber warfare, cloud computing, enterprise networks, communications, and command and control. [raneyc@spawar.navy.mil]

Kenneth Trabue—Trabue is the project manager for the Global Command and Control System—Joint, Integrated Imagery and Intelligence (GCCS-J I3) program at SSCPAC. In addition to his program management responsibilities, he also leads the GCCS-J I3 widget development effort under the Joint C2 Common User Interface (JC2CUI) project. Trabue is a retired U.S. Coast Guard C4ISR officer who served as the IT systems branch head for the USCG Intelligence Coordination Center, and was the USCG program manager for the CG Intelligence Support System. He has a Bachelor of Science degree in computer networking. [kenneth.trabue@navy.mil]

Timothy Boyce—Boyce has over 24 years of experience in C4I systems and serves as the head of the Strike Planning and Execution Branch at SSCPAC. He also provides project management support to the Global Command and Control System—Joint, Integrated Imagery and Intelligence (GCCS – J I3) program. Prior to his selection as a branch head, Boyce was the assistant program manager for logistics for Naval Mission Planning Systems at the Strike Planning and Execution Systems Program Office (PMA-281). Boyce is certified DAWIA Level III in Information Technology and Level II in Program Management and Lifecycle Logistics. [timothy.boyce@navy.mil]

Kari Nip—Nip graduated from the University of California, San Diego, with a Bachelor of Science in electrical engineering. She has since served as an electronics engineer in the Information Warfare Branch at SSCPAC. She has provided engineering and technical support to the DoD Storefront and PEO C4I Marketplace efforts. Prior to her work on these projects, she served as a systems engineer for the SBINet Demonstration project involving RF communications and networked sensors. [kari.nip@navy.mil]

Abstract

The Department of Defense (DoD) software acquisition policy struggles to adapt to the emerging trend of delivering lightweight applications on demand via application store technologies. The commercial world has evolved to where it now provides a constant stream of capabilities allowing customers to customize their information/communication devices with numerous applications.

DoD-created solutions are often inflexibly designed with limited adaptability due to requirements for reliability, communications security, and absolute need for accuracy. Because of this, acquisition processes are needed that allow warfighters to take advantage of

the rich Internet applications and Web 2.0 technologies currently available to the average consumer.

This paper identifies processes for employing a DoD application store that delivers software in a rapid, secure, and reliable manner. Leveraging the government-developed open source Ozone Widget Framework, web applications are developed and registered to a single repository. The warfighter can discover, access, and compose these web applications from the Ozone Marketplace.

To promote innovation and foster collaboration between the DoD and industry, the application stores in the DoD should include separate industry trial and demonstration sections. Industry partners can upload capabilities for demonstration/trial by the government and allow program offices to evaluate applications with the goal of selecting capabilities for Programs of Record.

Introduction

The Department of Defense (DoD) struggles to keep up with the commercial world when delivering new software technology to its customers. By the time new solutions are deployed to the warfighter, the technology is obsolete. The software industry's focus has evolved to include small flexible mobile code via widgets and other mobile applications (also referred to as "apps"). Several programs within the DoD have started similar initiatives that hold the promise of reducing the "heavy lifting" required as part of the current acquisition process.

IBM's 2006 *Global Technology Outlook* recognized the importance of a rapidly evolving software development paradigm as a driving force in web-based dynamic content and the manner in which it is delivered to the user primarily through "situational applications."

> Software development is going through a rapid evolution enabled by the ubiquity and ease-of-use of the web, simple to use software, tools, and techniques, dramatic rise in computer literacy, and the development of standards around Web Services. All these forces together are giving rise to a new paradigm for the collaboration, creation, manipulation of dynamic content with the web as the platform, a.k.a. Web 2.0. The building of situational applications – applications built with just enough function to satisfy a business need, usually by business users – by mixing and re-mixing existing components are becoming more and more common. These trends will force businesses to rethink how their applications and services are designed, developed, and managed. This in turn will put the onus on IT infrastructure companies to offer new tools for development, management and integration of situational applications and services. (IBM Research, 2006)[1]

IBM's insight into the emerging environment of situational applications and dynamic content demonstrated their predictive ability to understand forces that would significantly impact software development trends from six years ago. Since that time, the creation and use of situational applications throughout the private sector has exploded. While the DoD has only started to make inroads within this environment, several Programs of Record (POR) have embraced widgets and other mobile technologies, hoping to enhance warfighter situational awareness and access to information. Unfortunately, the Defense Acquisition System has not adapted to this new environment, making it difficult to field these technologies rapidly to meet emergent requirements.

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[1] Courtesy of International Business Machines Corporation, © 2006 International Business Machines Corporation.

Problem Statement—Defense Acquisition System

The 2010 findings and recommendations report from the House Armed Services Committee Panel on Defense Acquisition Reform (Andrews et al., 2010) cited ongoing problems with the performance of weapons systems acquisition programs throughout the DoD, noting $296 billion in cost growth and an average schedule delay of 22 months (p. 6). While the report specifically criticizes Major Defense Acquisition Programs (MDAP), given the software-intensive development associated with many MDAPs, they are a valuable benchmark in understanding where issues and concerns remain within the Defense Acquisition System. The report further notes issues with excessive development times, "Even in the Department's ninth year of active warfare during which large quantities of equipment have been consumed and numerous new mission needs have been generated, weapon systems acquisition remains typified by programs with development timelines lasting more than a decade" (Andrews et al., 2010, p. 6). According to the panel report, the problem is worse when compared with private-sector development and update cycles. Where private-sector cycles are 12–18 months, defense IT systems can routinely require 48–60 months to deliver a capability (Andrews et al., 2010, p. 17).

The problem with the defense acquisition process is well known within the DoD. According to a 2008 GAO report on defense acquisitions (Schinasi, 2008),

> A senior Army acquisition official recently testified before Congress that because the process can take more than a year, it is not suitable for meeting urgent needs related to ongoing operations; and a recent study by the Center for Strategic and International Studies indicates that the process is unwieldy and officials are now trying to find ways to work around it. (p. 6)

Given the listed problems with current acquisitions regarding cost overruns and schedule delays, it is easy to see that the flexibility and speed necessary to meet the needs of today's warfighter is not a critical factor within the Defense Acquisition System.

Details of the Current Process

In the current acquisition process, there are long lead times from development to deployment due to the need for highly secure, accurate, and reliable products.

The *Report of the Committee on Armed Services, House of Representatives on H.R. 5122* (U.S. Congress, 2006), revealed that MDAPs within the DoD have continued to exhibit increasing costs and extended schedules, which have a detrimental impact on the DoD's ability to field systems:

> The rising cost and lengthening production schedules of major defense acquisition programs has led to more expensive platforms fielded in fewer numbers. The committee believes that internal DOD pressure to develop follow-on weapons systems that include all necessary and anticipated military capabilities may create an over-reliance on individual "mega" systems that are potentially more expensive and time-consuming to develop than less sophisticated but capable systems. (p. 15)

Warfighters' emerging requirements cannot be met by the lengthy cradle-to-grave monolithic super systems of today and the past. Current trends toward lightweight web and mobile applications in the commercial environment have encouraged the DoD's development of these technologies.

Systems of record are currently exploring the advantages of deploying capabilities in this fashion; the long pole in this trend is the restriction applied by the acquisition rules and

structure. These limitations bog down the creative methods for exposing these lightweight capabilities. The added burden to explore various hardware platforms, desktops, laptops, tablets, and phones presents unique issues beyond just security. The efforts to provide oversight and governance in the development and deployment of the software and hardware packages are in the early stages and are being worked as an Integrated Project Team (IPT) with representation from key stakeholders across the DoD.

The process of running a widget through the same acquisition milestones as a Program of Record (POR) is cost and time prohibitive. The time and money that would be required in this situation removes the widget from a warfighter's arsenal, potentially answering a current need, and relegates it to the acquisition world of "someday." Cyber systems represent one of our strongest and most potent weapons and are critical elements in the battle space of warfare. We cannot continue to equip Soldiers and Sailors with capabilities that are inferior or unequal to those of our adversaries.

Commercial-Industry Approach

Current acquisition rules applied to POR systems have caused a major gap between the technology available to the warfighter and that which is commonly used within the commercial sector. This is exacerbated by the increased capabilities of mobile computing with smart phones and tablets. The average person now possesses more computing power than some mainstream systems used in our military. This technology gap is exaggerated for younger Service members exposed and accustomed to this technology and then forced to use outdated information technologies.

Today's commercial industry provides a constant stream of technological capabilities through an almost endless supply of applications. Customers have the ability to search for mobile applications that function to fulfill their specific needs, and they are also provided continual updates to existing applications that offer additional functionality and/or increase performance. This allows industry leaders to provide a means for application developers to rapidly make their applications available to users with the appropriate communication device.

Apple Inc., a leader in mobile technology, produces devices with application software capabilities. The Apple App Store contains Apple-created applications and third-party mobile applications, which are available where they may be discovered and downloaded by the customer.[2] An app approval process is in place to ensure that submitted applications are reliable, perform as explained, and adhere to Apple's stringent requirements regarding appropriate content (Apple Inc., 2012). Developers are equipped with the App Store Review Guidelines, a document with review criteria, rules, and examples for a wide range of development topics. Upon submission for review, the applications are checked for compliance with the App Store Review Guidelines. If the apps comply with the technical, content, and design criteria, they are made available in the App Store. If an application is rejected, the developer can submit an appeal to the App Review Board if it is believed that the functional or technical implementation was misunderstood (Apple Inc., 2012).

In the Android world, registered developers of applications for Google's Android Operating System (OS) can publish their application to the Android App Section of Google Play, provided it meets a set of requirements that are enforced by the Google Play server during upload of the application (Google Inc., 2012). Google does not take on any obligation to monitor applications uploaded to Google Play, but it does place restrictions on application

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[2] *Widget & Mobile Technologies a Forcing Function for Acquisition Change* is an independent research paper and has not been authorized, sponsored, or otherwise approved by Apple Inc.

content, network usage, spam, and processing payments. If an application violates these restrictions, Google has the authority to remove the application from Google Play (Google Inc., 2012). Without a review process, it may only take a couple minutes to an hour to publish an application to Google Play and make it available to Android device users.

The Amazon Appstore, an alternative mobile application store for Google's Android OS, also has an approval process for apps. Apps submitted to the Amazon Appstore are tested to ensure that they work as described in the product description, do not impair the functionality of the user's mobile device, and comply with the Appstore Distribution Agreement and Amazon's content guidelines. If reviewers have a question about the app or if the app does not meet the Amazon Appstore's acceptance criteria, the submitter is notified via e-mail (Amazon.com Inc., 2012).

Overview of Recommended Solution

The Department of the Navy (DoN)/DoD lacks a lightweight web application test and integration environment to effectively model, test, exercise, and perform certification and accreditation of widget capabilities. Although the need for this environment has been recognized, there is a lack of dedicated funding for an infrastructure-supported technological solution. This environment is essential for the DoN workforce to effectively meet widget operational missions through individual developer testing. Additionally, if the DoN is to realize efficient and effective deployments of new, highly accurate, secure, and functional technologies, a comprehensive test and integration (T&I) and evaluation environment is required.

The requirement for a widget T&I environment has been identified with widget technology development throughout the DoD. Current widget efforts include DoD Chief Information Officer (CIO) Storefront Pilot, National Security Agency (NSA) Denver Store, Global Command and Control Systems—Joint Integrated, Imagery and Intelligence (GCCS-J I^3), Command and Control Rapid Prototyping Continuum (C2RPC), Integrated Intelligence Architecture (I2A), and so forth.

This document proposes a DoN/DoD widget T&I environment that incorporates the unique and common aspects of Navy widget environments. This T&I environment will replicate not only the environment that connects directly to the Global Information Grid (GIG), but also Navy afloat, ashore, deployed, and limited communication environments (hardware, software, and associated configurations). The resulting environment will be separate from operational environments and provide the DoN the capability to perform T&I, as well as automated testing to include certification and accreditation (C&A) of widgets. This will create a Navy-trusted source environment for widget transition to the fleet and develop more effective and efficient techniques, processes, and procedures to achieve speed to capability.

The proliferation of widget technology requires standards, specifications, processes, and a T&I environment to ensure proper products are discoverable by the warfighter. The widget T&I environment will provide a composable mission-based set of software capabilities to accomplish mission tasking and will enable software-based mission capabilities to be released in a couple weeks rather than months or years.

A DoD marketplace or application store could rapidly and securely field software capabilities to the warfighter in the form of widgets and web applications. Widgets provide a technological capability to foster this rapid fielding ability. Widgets continue to gain in popularity over traditional thick applications due to their ease of creation, variety of capabilities, and reduced development time (MITRE Corporation, 2012). Since widgets provide very specific functionality and generally require a relatively small amount of software

code, developers can create them on a relatively short timeline. This means new capabilities can be developed quickly in response to user needs and, with a widget T&I environment and an application store, these widget capabilities can be made available for search and discovery by the user.

Detailed Architecture and Process

Ozone Widget Framework (OWF)

What is a Widget?

The *Ozone Widget Framework User's Guide* (Boyd, 2011) refers to widgets as lightweight, single-purpose, web-enabled applications that users can configure to their specific needs. Widgets can provide summary information or a limited view into a larger application. They can also be used alongside related widgets to provide an integrated view as required by the user (Boyd, 2011).

Ozone Widget Framework

The Ozone Widget Framework (OWF) is a platform that offers infrastructure services to simplify the development of workflows and presentation-tier application integration. It is also a layout manager for the operation of widgets on a single web page. Widgets, which are web applications that can be installed and executed in a web browser, display information or provide dynamic content from a backend or local service. Just like any widget framework, the OWF supplies the structure and templates for creating widgets, providing users with the capability to develop, share, and operate widgets. Unlike a standard browser window, the OWF allows users to load and operate multiple widgets within a single webpage rather than opening multiple browser windows or tabs to display more than one widget. This allows users to view a great amount of information on a single webpage. From an intelligence analyst's standpoint, the OWF provides a means to conveniently search, access, and display intelligence data on a single display.

The OWF allows users to load widgets, select a layout type called a dashboard layout, and customize the arrangement of the widgets within the dashboard. The OWF supports multiple dashboard layouts, including desktop, tabbed, portal, and accordion. The desktop layout allows users to arrange and drag widgets anywhere within the browser window, much like a desktop application on a standard operating system desktop. The tabbed, portal, and accordion layouts fix the widget positions in the browser, but users are able to select which widgets are assigned to the fixed locations, creating a customized display. The dashboard layout and arrangement of widgets is saved when a user logs out of the OWF so the next time the account is accessed the entire layout is maintained (Boyd, 2011).

The OWF also provides a suite of application programming interfaces (APIs), allowing widget developers to enhance their web applications using inter-widget communication, user preferences, and internationalization. Each API is written in JavaScript so that widgets can be built in a large variety of web technologies. Therefore, widgets can be written in the JavaScript-capable technology of the developer's choice.

The OWF, originally developed and sponsored by the NSA as a government off-the-shelf (GOTS) solution, is now government open-source software (GOSS) with a collaborative software development model. The OWF GOSS Program is responsible for the maintenance of OWF and Ozone Marketplace (OMP) software releases. The OWF GOSS board, currently comprised of members from NSA, the DoD CIO, Intelink, SPAWAR Systems Center Pacific (SSCPAC), the Central Intelligence Agency (CIA), the Defense

Information Systems Agency (DISA), the National Reconnaissance Office (NRO), and the Intelligence and Security Command (INSCOM), can distribute development priorities to any government agency or program requesting the source code for either its own use or for updating. These agencies are encouraged to submit software patches and feature enhancements to improve the baseline code and benefit the community of projects utilizing the OWF and OMP.

Widgets in Action

Command and Control and Intelligence Widgets

Several communities within the DoD have embraced the OWF and widgets. For example, the GCCS-J I^3 program has been actively developing widgets for various Naval commands (I^3 Common Geospatial Display Widget, I^3 Vessels of Interest Widget, I^3 Maneuver Unit Widget, I^3 Latest DMOB Equipment Widget, I^3 Naval Activity Widget, I^3 Channel List Widget, I^3 Blue Forces Widget, I^3 AOB Widget, I^3 Recent Activity Widget, I^3 Targeting Widget, I^3 Weather Observation Widget, and I^3 Weather Forecasting Widget). The Distributed Common Ground System—Army (DCGS-A) has created a suite of widgets for their users (Common Admin Widget, Common Help Widget, Common Query Widget, Common Map Widget, Coordinate Conversion Widget, DIB Query Widget, plus over 50 additional widgets providing weather, HUMINT, IMINT, Geospatial, and Alerting tools). The Defense Intelligence Information Enterprise (DI2E) has selected OWF for use within its development and the Joint Command and Control Common User Interface (JC2CUI) has selected the OWF as one of its two common clients. GCCS-J I3, DI2E, and JC2CUI have all embraced the OWF to provide situational awareness and improved usability tools to their users, but each program requires a consolidated resource from which the widgets and associated services are made discoverable. These are not the only widget development efforts underway within the DoD; there are many operational commands that have expressed interest in developing their own widgets. This operationally focused development effort is affectionately known as "Engineering at the Edge."

Engineering at the Edge

The DoD's dependence on large-scale acquisition programs is well documented. MDAPs that provide end-to-end solutions attempting to satisfy a system's full requirements baseline often produce very complex applications that are difficult to use and train. These projects are also subject to strict acquisition and other approval, testing, and fielding requirements. Engineering at the Edge seeks to use the OWF and widgets to reduce an operational command's dependency on end-to-end systems development efforts that need years to develop and may not address requirements that have emerged since development started. Fortunately, the OWF has enabled the DoD community to decouple the user interface and visualization components from the rest of the architecture.

Over the past several years, many of today's PORs have developed robust data services and web-service interfaces to support third-party client data access requirements. Understanding that operational commands need access to these robust data services, Engineering at the Edge offers additional capability by supplementing the OWF with a robust C4ISR Widget Developer's Toolkit (WDT). The WDT includes widget guidance, training, and a functional software development kit that will allow the developer community to be extended to include the operational and tactical commands, within a controlled environment. These Engineering at the Edge developers will now have the tools and processes necessary to manage and view data based on specific user needs in order to meet ad hoc and emerging operational requirements. Using the WDT, Engineering at the Edge developers

can leverage the robust C4ISR architecture that has been deployed by large programs, without being tied to their rigid cost, performance, and schedule restrictions.

With the abundance of existing widgets and potential for numerous widgets created through Engineering at the Edge, users need a common resource to search for and discover existing widgets for use. This is accomplished through the use of the Ozone Marketplace.

Ozone Market Place (OMP)

The Ozone Marketplace (OMP) is a thin-client registry of applications and services similar to a commercial-industry application store, such as the Apple App Store or Google Play. Generally, it is a directory where widgets are submitted and can be shared for others to search, access, and use. The OMP is the marketplace specific to the OWF (Figure 1). It can also stand on its own but is usually utilized with Ozone. The OMP is also a part of the OWF GOSS Program so it undergoes updates and new releases made by the OWF GOSS Board.

From a user standpoint, the OMP is where analysts can search for widgets that provide desired information and can add the selected widgets to their system for use. Developers can upload their widgets to the OMP and provide associated metadata, but OMP administrators have the ability to approve or reject widgets submitted to the OMP. Therefore, users can only utilize widgets once they have been approved by the OMP administrators. One example of an OMP for warfighter use is the PEO C4I Marketplace.

Figure 1. Ozone Widget Framework/Ozone Marketplace

PEO C4I Marketplace Overview

Before new capabilities are made available to the warfighter, they must undergo developmental tests, operational tests, and a strict C&A process. All of these tests can take as long as nine months, enough time for the "new" technology to become out of date and unresponsive to immediate user needs. One of PEO C4I's FY2012 strategic goals is to "foster focused innovation to rapidly field relevant capabilities to meet existing and emerging warfighter needs" (Goal 2.4). Widgets provide a technological capability to foster this rapid fielding ability and provide the potential to rapidly implement Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and

operational capabilities to the warfighter. Widgets are being deployed in the Navy operational environment as part of formal software builds and releases for PORs. However, the traditional method of providing software to the fleet typically does not support agile deployment of widgets.

To further Goal 2.4 in August 2011, the following two tasks were approved by PEO C4I:

- Task 2.4.1—Set up an application storefront on SIPRNET and JWICS for the delivery of C4I widgets.
- Task 2.4.2—Establish an Agile Widget Approval IPT to develop a business process for developing, modifying, approving, and remotely deploying widgets.

The PEO C4I Marketplace and a governance process specific to widgets submitted by an accredited POR will reduce lead times and ensure that widgets are efficiently and securely introduced in a production environment for the warfighter.

PEO C4I Marketplace architecture can decrease the infrastructure, and certification and accreditation burden on the operational user by decoupling the widget capabilities from his or her browser in the operational environment. Figure 2 depicts the operations architecture of the PEO C4I Marketplace. An operational user can discover widget capabilities from metadata in his or her operational Ozone Marketplace, which are then served from an accredited Ozone Widget Framework server to accredited Integrated Shipboard Network System (ISNS) devices (e.g., desktops or mobile devices). The widget may actually be hosted in a distinct environment, such as CANES or GCCS-I[3], which can provide the backend services and data that comprise the capability. Because a widget, backend services, and associated data may reside and operate completely within accredited environments and are transported over secure communications means, the accreditation burden can be greatly reduced.
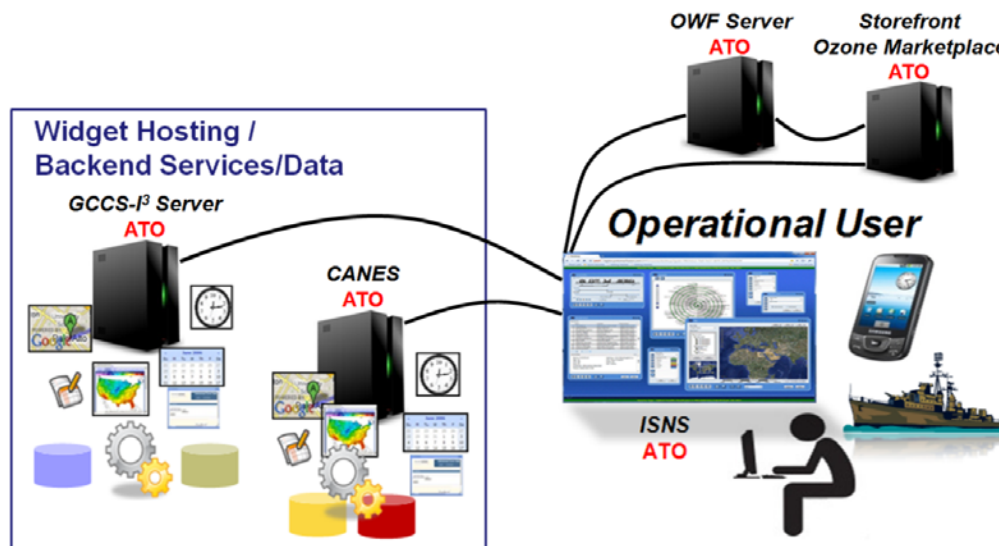
Figure 2. PEO C4I Marketplace Operations Architecture

Other PEO C4I efforts to quickly deploy new technologies to the warfighter, such as widget development, migration of PEO C4I capabilities to the Cloud, and Cloud Task Force, will be brought together by the PEO C4I Marketplace and widget governance processes. They demonstrate a unified end-to-end process for taking a widget capability through

development, test, certification, approval, and delivery. Figure 3 illustrates the integration of the PEO C4I Marketplace and the Navy Cloud.
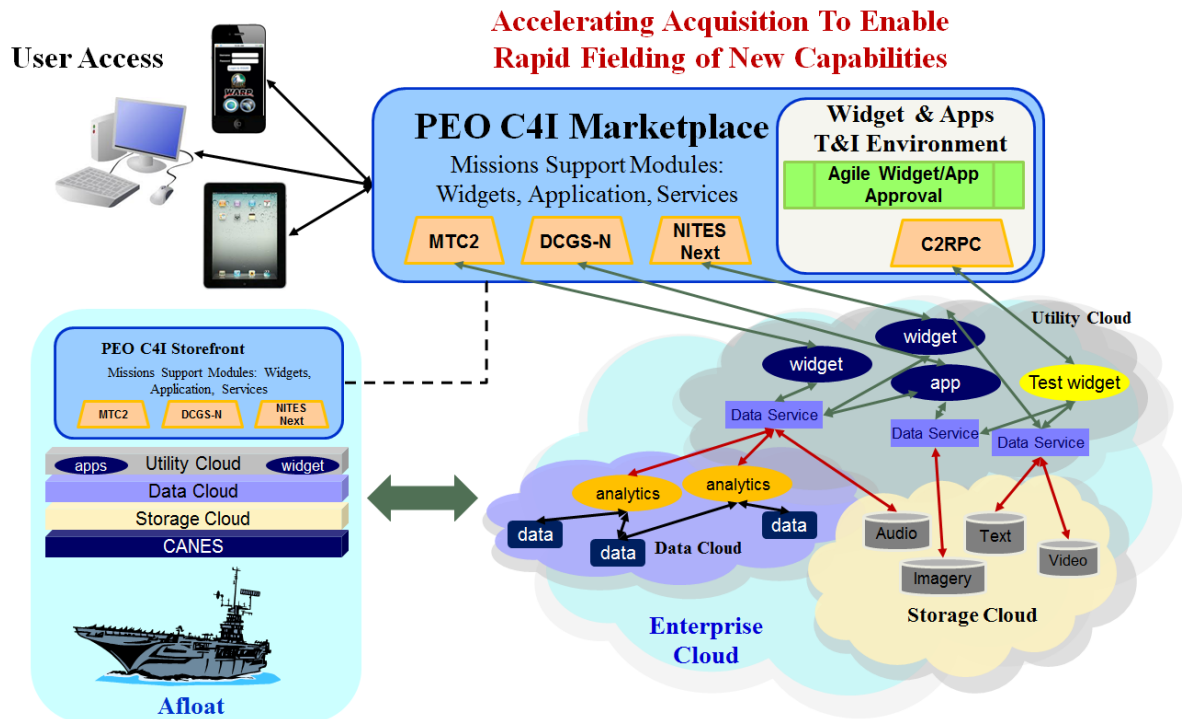

Figure 3. PEO C4I Marketplace Operations Architecture

The PEO C4I Marketplace seeks to increase the speed at which new capabilities are provided to the warfighter by creating an efficient test, verification, and validation process to govern widgets. Figure 4 depicts the operational concept of the PEO C4I Marketplace. A widget developer produces a widget, which is submitted to the T&I Marketplace Environment for testing. The PEO C4I Widget T&I Team provides feedback to the widget developer on improvements needed to make the widget compliant with the Operational PEO C4I Marketplace standards, enforced by the Operational Designated Approval Authority (ODAA) and Commander, Operational Test and Evaluation (COMOPTEV). Upon completion of all testing, the widget is promoted to the Operational Marketplace Environment. From there, the operational user can discover the widget from a marketplace (applications store) and consume the capability in an operational environment. Ultimately, the operational user can provide feedback about the widget to build on the existing capability or to inspire new capabilities.
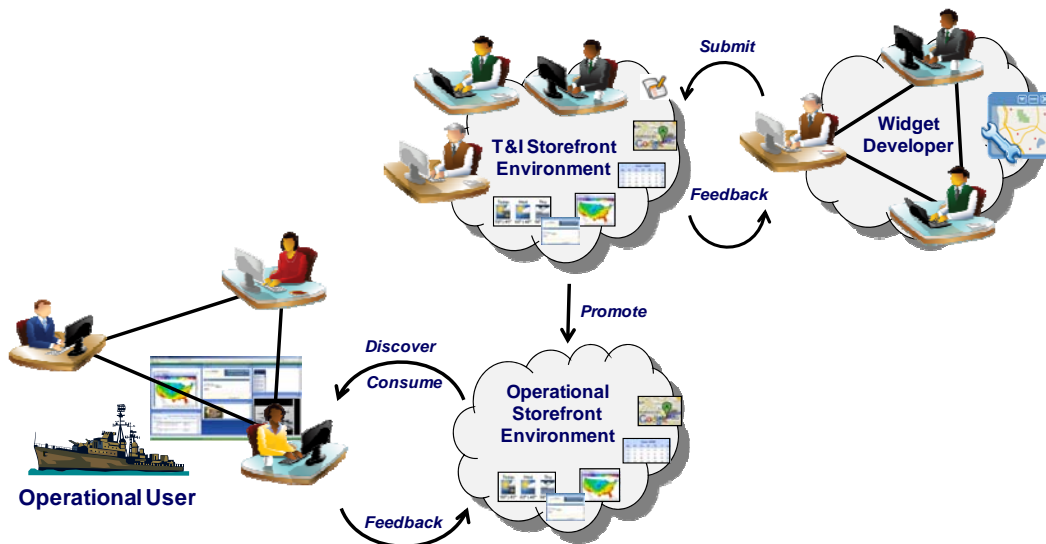
Figure 4. PEO C4I Marketplace Operational Concept

Widget Governance Tool

Widget governance is how an organization establishes and controls its processes and policies regarding widgets. It includes a system to track and record where a widget is within a widget process and checks for its compliance with existing policies. By establishing an efficient test and evaluation process to govern widgets and approve their acceptance into a marketplace, the lead time for a developmental concept to reach the warfighter can be greatly reduced.

Figure 5 provides an overview of the widget governance tool that governs a widget, beginning with its initial submission to the widget governance process to its acceptance into the operational environment where it is becomes available for use by the warfighter.
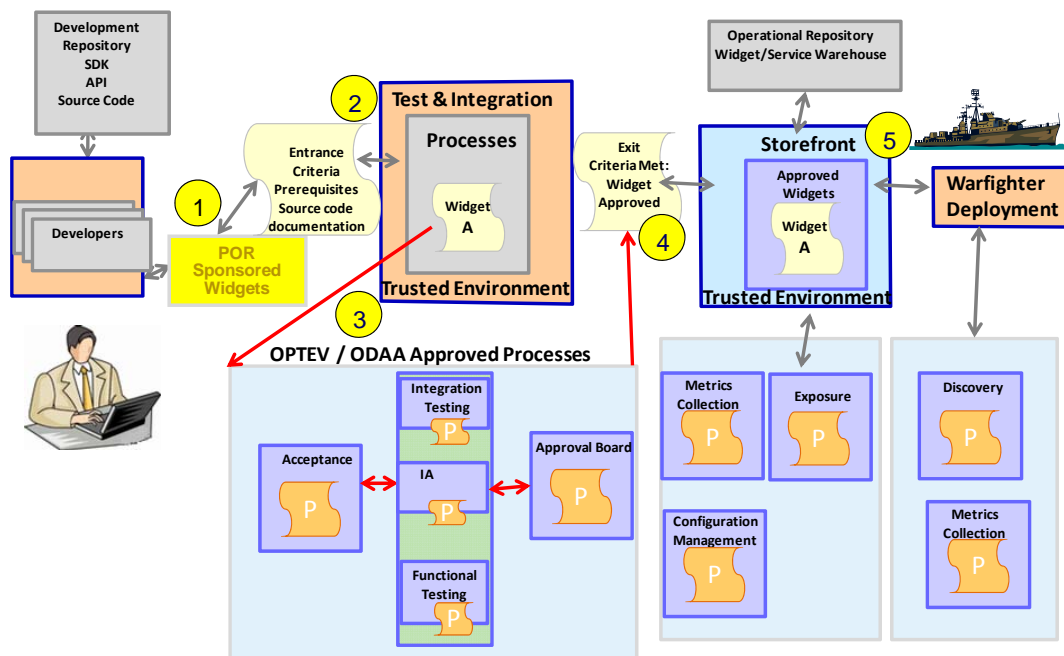
Figure 5. Widget Governance Process

Developers provide widgets to PORs, which expose capabilities in a widget framework (1). The widgets must meet entrance criteria for introduction to the test and integration (T&I) environment (2), which includes the source code, descriptive metadata, configuration documentation, and developer testing results for the target production environment. Applying COMOPTEV/ODAA-approved processes, the widget passes through a number of manual and automated tests to ensure suitability for the production marketplace environment (3). Upon review of the test results, which verify that the widget meets the exit criteria (4), the widget is approved to be introduced into the marketplace operational environment (5) and is made readily available to the warfighter.

Figure 6 is a detailed process flow for the widget governance tool.
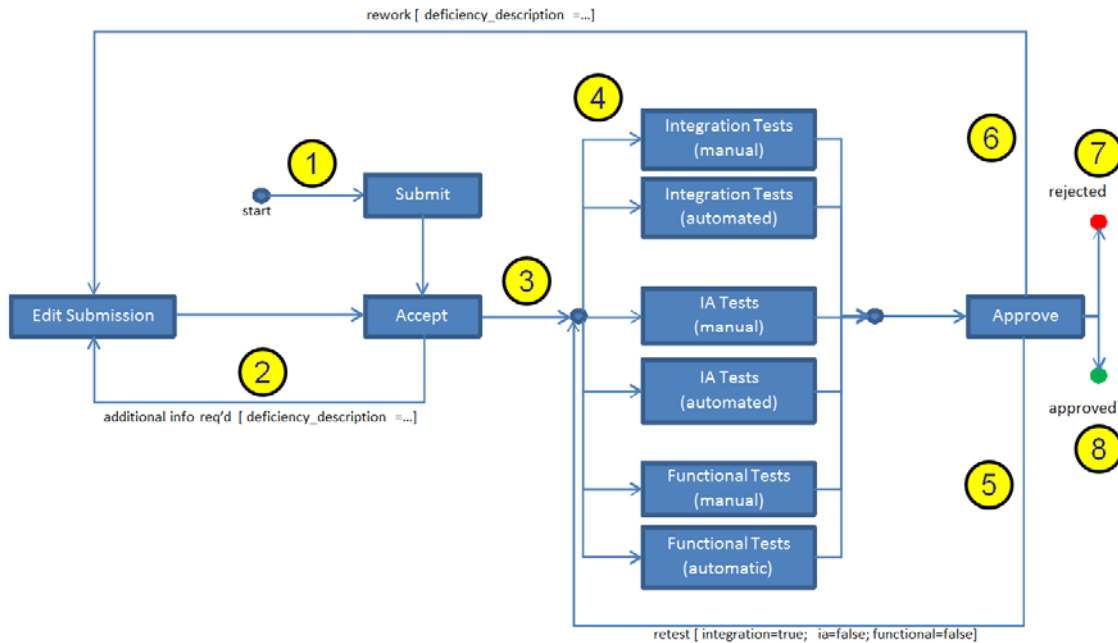
Figure 6. Detailed Widget Governance Process Flow

A widget submission package (WSP) is submitted (1), which contains source code and documentation of the widget and application programming interface (API), as well as metadata describing the function, user guidance, characteristics, boundaries and deployment locations, preferred browser and system configuration, installation instructions, and dependencies. Developer functional, IA, and integration test reports are also included, as well as a mobile code risk-mitigation strategy and a statement that the widget has been developed in accordance with Mobile Code Developer's Guidance and a Security Technical Implementation Guide (STIG) report. All required components of the WSP are indexed for ready reference. If the package does not pass the acceptance test (1), a report of deficiencies is provided and the submitter is provided the opportunity to edit and correct the submission (2). If the WSP passes the acceptance sub-process, the package is provided for functional, IA, and integration testing sub-processes in the T&I environment (3).

The functional, IA, and integration testing is conducted in parallel to the greatest extent possible in order to optimize testing resources and make the procession of the WSP through the process efficient (4). Functional testing will focus on the proper operation of the widget in generating the desired output in a widget as described by the POR. Integration testing will concentrate on how well the widget performs in the marketplace environment (e.g., with the widget framework, identity management solution, etc.) and also amidst other

widgets. IA testing will ensure that the widget meets OWF standards, that backend services and data inherit configuration attributes from their accredited parent environments, that information is exchanged over a secure channel, and that the widget operates in a manner that ensures an acceptable level of security. Some tests will be conducted manually by the T&I test team, but automation is desired to the greatest extent possible to decrease the amount of time and manual effort required to designate a widget suitable for the operational marketplace environment.

Upon completion of the preceding tests, the results will be aggregated and compiled for the approval board sub-process. The board may determine that a WSP needs to be returned to the T&I test team if the results did not demonstrate acceptable functional, IA, or integration testing results (5). A widget may also be ordered to be reworked by the developers if major deficiencies exist that must be corrected prior to deployment to the operational marketplace environment (6). Additionally, a WSP may be rejected if the content rendered or output of the widget is deemed to be inappropriate or of no-added value in the marketplace environment (7), or approved, making it available to the warfighter in the production marketplace environment (8).

Conclusions

The DoD can no longer continue down its current acquisition path providing yesterday's solutions to meet today's immediate needs. The DoD must modify its view of acquisition. As technology is constantly evolving and improving, the DoD's struggle to keep up with the latest capabilities hinders it with lengthy acquisition schedules and unsustainable costs. The current commercial trend of delivering small, lightweight, mobile applications to an application store has allowed industry leaders to provide a consistent stream of new capabilities to their customers. The DoD, however, has struggled to adopt this notion of rapid fielding of capabilities.

The future of warfare is information dominance and speed to capability. Lightweight web applications can supply the warfighter with valuable information that can be developed in a short period of time since they are composed of a generally small amount of code. With shortened development times, immediate user needs can be addressed and satisfied more quickly. Widgets provided by an already-accredited POR do not need to undergo the certification and accreditation processes that lengthen acquisition schedules and, ultimately, consume costs. New widget technologies and smaller testing efforts that make them available within an application store will introduce a paradigm shift in the development and delivery of capabilities to the warfighter. The PEO C4I Marketplace and accompanying Widget Governance Tool will provide this widget technology in a cost-effective and expedient fashion, while ensuring trusted and secure information capabilities.

References

Amazon.com Inc. (2012, January). Amazon Appstore developer portal frequently asked questions. Retrieved from https://developer.amazon.com/help/faq.html#ApprovalProcessandContentGuidelines

Andrews, R., Coffman, M., Conaway, K. M., Cooper, J., Ellsworth, B., Hunter, D., & Sestak, J. (2010). House Armed Services Committee Panel on defense acquisition reform findings and recommendations. Washington, DC: U.S. Congress, House of Representatives.

Apple Inc. (2012, January 19). App Store review guidelines. Retrieved from https://developer.apple.com/appstore/guidelines.html

Boyd, R. (2011, September 27). Ozone Widget Framework user's guide. Retrieved from https://software.forge.mil/sf/go/doc20589?nav=1

Google Inc. (2012a, January 19). Android market developer program policies. Retrieved from http://www.android.com/us/developer-content-policy.html

Google Inc. (2012b, January 19). Publishing overview. Retrieved from http://developer.android.com/guide/publishing/publishing_overview.html

IBM Research. (2006). *2006 global technology outlook*. Yorktown Heights: IBM Research.

MITRE Corporation. (2012, February). *Widget framework governance*.

Schinasi, K. V. (2008). *Defense acquisitions: Better weapon program outcomes require discipline, accountability, and fundamental changes in the acquisition environment*. Retrieved from http://www.gao.gov/assets/130/120228.pdf

U.S. Congress. (2006). *Report of the Committee on Armed Services, House of Representatives on H.R. 5122*. Retrieved from http://www.gpo.gov/fdsys/pkg/CRPT-109hrpt452/pdf/CRPT-109hrpt452.pdf

Widget & Mobile Technologies a Forcing Function for Acquisition Change

Presented to:

Acquisition Research Symposium
Naval Postgraduate School
17 May 2012

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Integrated C^{2}I Engineering Division

Agenda

▼ **Introduction**

▼ **Problems with the Defense Acquisition System**

- The Current Process
- Industry Approach

▼ **Overview of Recommended Solution**

▼ **Ozone Widget Framework**

▼ **Widgets in Action**

▼ **DOD Storefront and PEO C4I Marketplace Overview**

▼ **Widget Governance Process**

▼ **Conclusion**

Introduction

▼ The commercial world has shifted focus to small flexible mobile code via widgets and other mobile applications

▼ IBM's Global Technology Outlook for 2006 noted an impending shift toward "situational applications"

- Rapidly evolving software development paradigm
- A driving force in delivery of web-based dynamic content

▼ Using standard acquisition processes in DOD, by the time new solutions are deployed to the warfighter, the technology is obsolete

▼ Several programs within the DOD have started similar initiatives that hold the promise of reducing the "heavy lifting" required as part of the current acquisition process

Problems with the Defense Acquisition System

▼ Major defense acquisition programs continue to experience significant cost growth and schedule delays

- In a 2008 report to Congress regarding an evaluation of 95 MDAPs, the GAO noted
  - $296 Billion in cost growth
  - Average schedule delays of 22 months

▼ Excessive development and update cycles

- Private sector cycles are 12 -18 months
- Defense IT systems routinely require 48 - 60 months

The Current Process
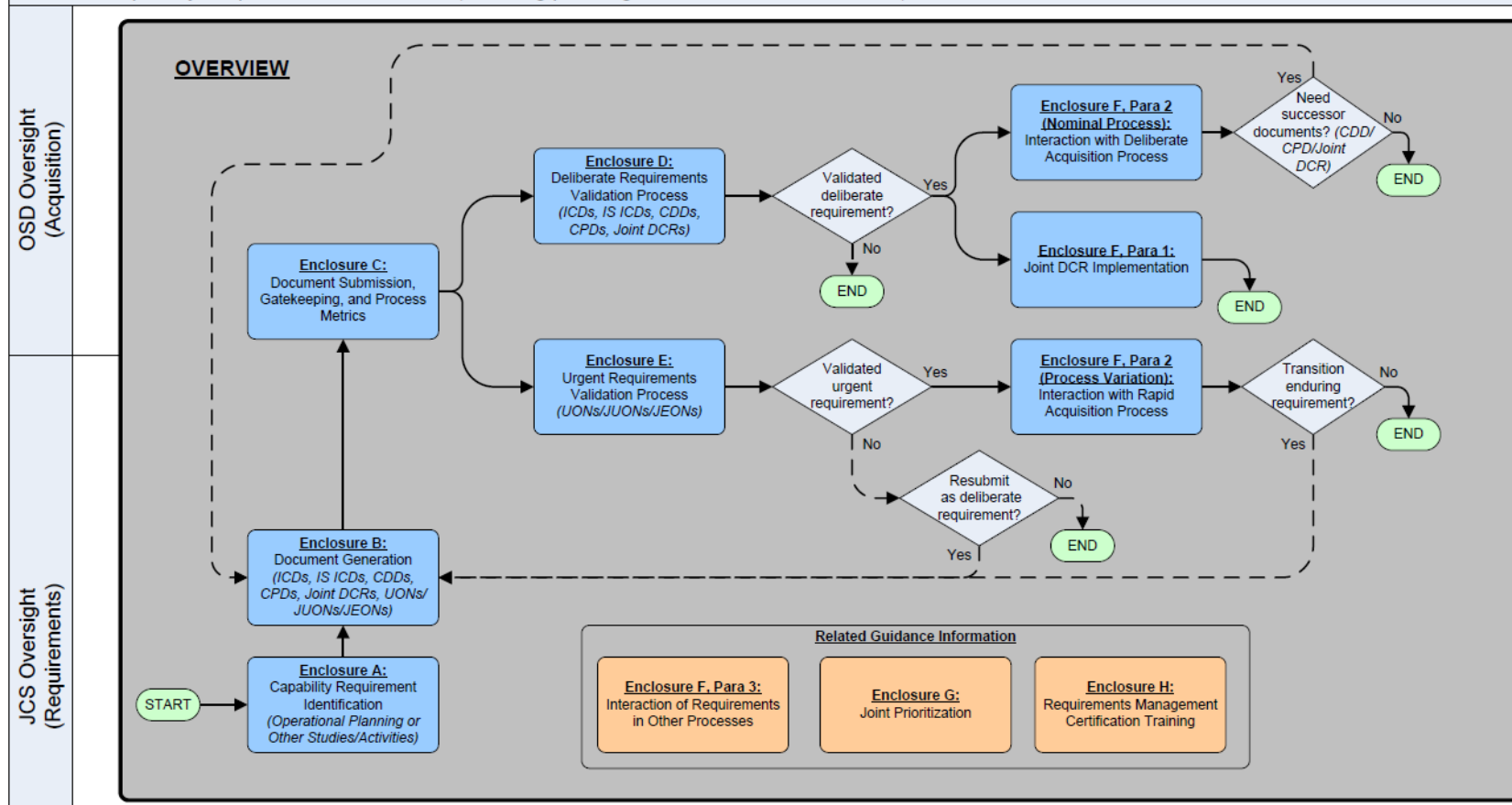
Industry Approach

▼ Current acquisition rules required for POR systems have caused a major gap between the technology available to the warfighter and that which is available commercially

- Exacerbated by capabilities of smartphones and tablet computers
- Greater gap for younger service members raised on commercial technologies and then forced to use outdated systems

▼ Apple and Google are both known for their mobile operating systems and the applications (or "apps") that run on them

- Both companies have "app" stores that allow developers to rapidly deploy applications, but they do so in very different ways

Overview of Recommended Solution

▼ DON/DOD lacks a lightweight web application test and integration (T&I) environment

- Needed to model, test, exercise, and perform certification and accreditation of widget capabilities

▼ A Widget T&I environment is required for widget technology development throughout the DOD

▼ A DON/DOD widget T&I environment is needed that incorporates the unique and common aspects of Navy widget environments

What is a Widget?

- ▼ Lightweight
- ▼ Single-purpose
- ▼ User configured
- ▼ Web-enabled application
- ▼ Provides summary information or a limited view into a larger application
- ▼ Also used alongside related widgets to provide an integrated view

Ozone Widget Framework

▼ A platform that offers infrastructure services to simplify the development of workflows and presentation-tier application integration

▼ It is also a layout manager for the operation of widgets on a single web page

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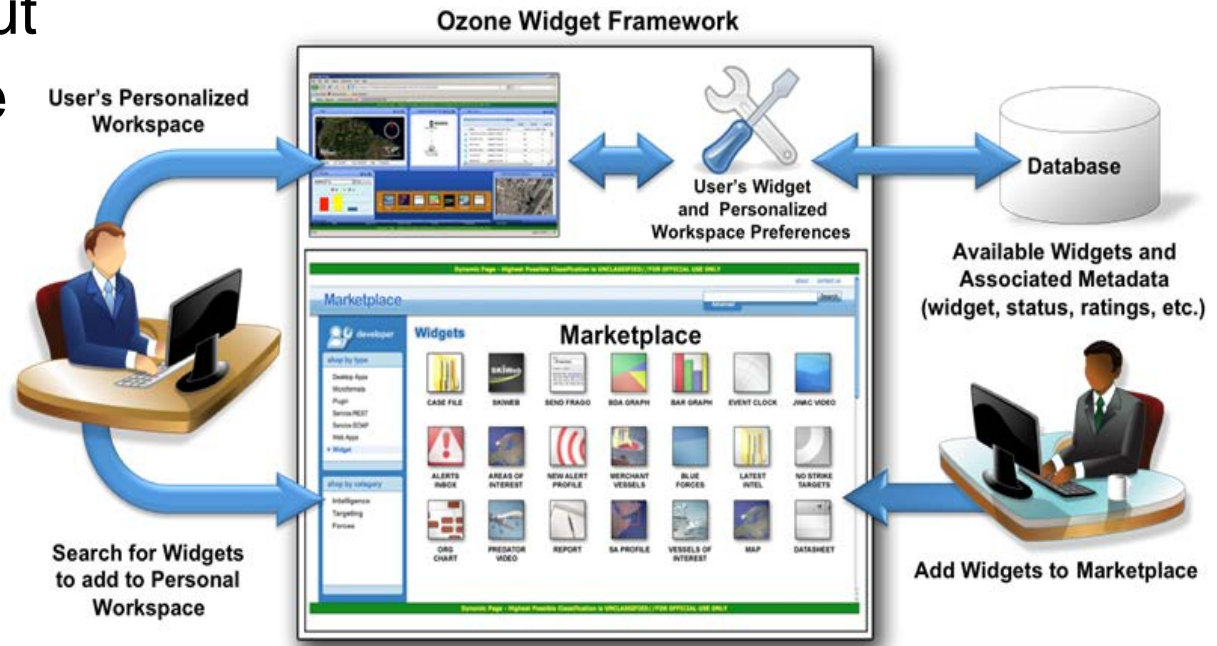
DOD Widget Efforts

▼ DOD Chief Information Officer Storefront Pilot

▼ National Security Agency Denver Store

▼ Global Command and Control Systems – Joint

- Joint Command and Control Common User Interface (JC2CUI)

- Integrated, Imagery and Intelligence

▼ Command and Control Rapid Prototyping Continuum

▼ Integrated Intelligence Architecture

▼ Defense Common Ground Station Army & Army Mission Command

▼ Defense Intelligence Information Enterprise Framework (Di2E-F) Quick Response Capability

Widgets in Action – Sample Widgets

▼ **GCCS-J I^3 Sample Widgets**

- I^3 Common Geospatial Display Widget
- I^3 Vessels of Interest Widget
- I^3 Maneuver Unit Widget
- I^3 Latest DMOB Equipment Widget
- I^3 Naval Activity Widget
- I^3 Channel List Widget, I^3 Blue Forces Widget
- I^3 AOB Widget
- I^3 Recent Activity Widget
- I^3 Targeting Widget
- I3 Naval Order of Battle Tracking
- I3 Motion Imagery Viewer

▼ **DCGS-A Sample Widgets**

- Common Admin Widget
- Common Help Widget
- Common Query Widget
- Common Map Widget
- Coordinate Conversion Widget
- DIB Query Widget
- plus over 50 additional widgets
  - Weather
  - HUMINT
  - IMINT
  - Geospatial
  - Alerting tools

Widgets in Action – Engineering at the Edge

▼ Seeks to use OWF and widgets to reduce an operational command's dependency on end-to-end systems development efforts that need years to develop and may not address requirements that have emerged since development started

▼ OWF has enabled the DOD community to decouple the User Interface and visualization components from the rest of the architecture

Widgets in Action – Widget Developer's Toolkit

C4 Widget Cookbook

- Guidance Recipes
- READMEs

C4 Widget SDK

- Scripts
- Core Widgets
- Widget Templates
- Code Demos
- Configured Environment
- Test Data

C4 Widget Training

- Boot Camp
- Online Tutorials

Widgets in Action – Widget SDK Test Environment

A distributable development, test, and debug environment for widget development.

Code Demos

- Example code and tutorials for developing various Web and OWF widget concepts.

Configured Environment

- A package with the C4 Widget SDK components and an environment with OWF, OMP, various testing and debugging tools, and OWF extensions already installed and configured.

Test Data

- Unclassified data for widgets and services to utilize in order to better prototype and test functionality.

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Widgets in Action – Widget Training

Provide a means for developers to gain remote and local experience with widget development and using the toolkit.

Boot Camp

- 2 day instructor-led presentations and hands on examples with widget development and toolkit concepts and products geared for developers of all skill levels.

Online Tutorials

- Observe & Take Action (OTAs) videos using the toolkit and developing widgets.
- Recorded boot camp tutorials via WebEX/DCO

DOD Storefront OV-1

DoD User Environment
- Enterprise Application Framework
- Productivity applications and widgets
- Collaboration
- Social Networking
- Publish/Discover
- Search/Retrieve

DoD User Environment

Requirements

Feedback and New Opportunities

Storefront Application Marketplace

Developer Environment

Adopt Capabilities

Deploy Capabilities

SSO

Response

DoD Service Providers Environment

Requests

Developer Environment
- Project hosting
- Collaboration/SNS tools
- APIs/SDKs
- Documentation
- CM tools
- C&A support

PEO C4I Storefront & Navy Cloud

Accelerating Acquisition To Enable Rapid Fielding of New Capabilities

User Access

PEO C4I Storefront

Missions Support Modules:
Widgets, Application, Services

- MTC2
- DCGS-N
- NITES Next

Widget & Apps T&I Environment

Agile Widget/App Approval

- C2RPC

PEO C4I Storefront

Missions Support Modules: Widgets, Application, Services

- MTC2
- DCGS-N
- NITES Next

- apps
- Utility Cloud
- widget
- Data Cloud
- Storage Cloud
- CANES

Afloat

Utility Cloud

- widget
- widget
- app
- Test widget
- Data Service
- Data Service
- Data Service

Data Cloud

- analytics
- analytics
- data
- data
- data
- data

Storage Cloud

- Audio
- Text
- Imagery
- Video

Enterprise Cloud

17
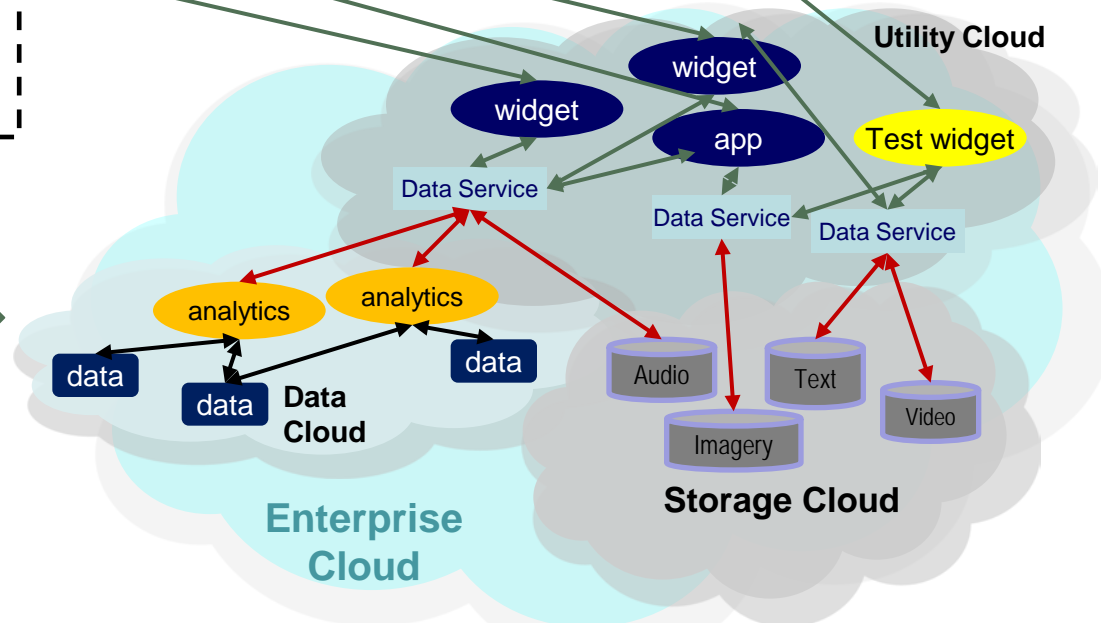
Widget Lifecycle and Operational Architecture

Developer

Submit code

SSC Development Repository

Load widgets to be tested

E2C Lab

SF	OWF
GCCS I³	DCGS-N

T&I Environment

Operational Storefront

OPS Architecture

OWF Server
ATO

GCCS I³ Server
ATO

Storefront Ozone Marketplace
ATO

DCGS-N Server
ATO

User

ISNS
ATO
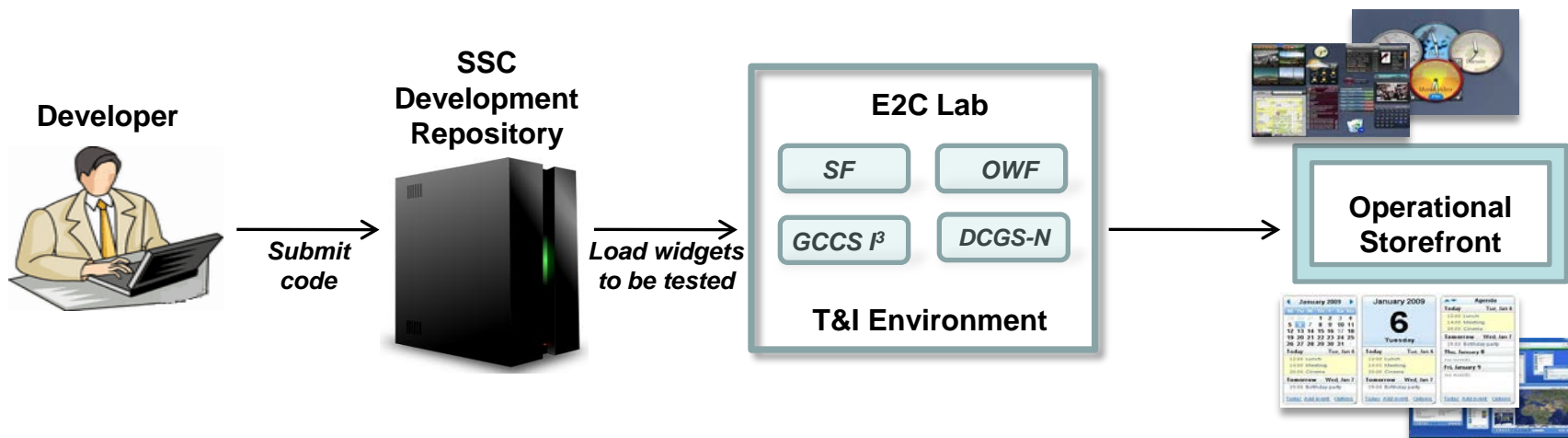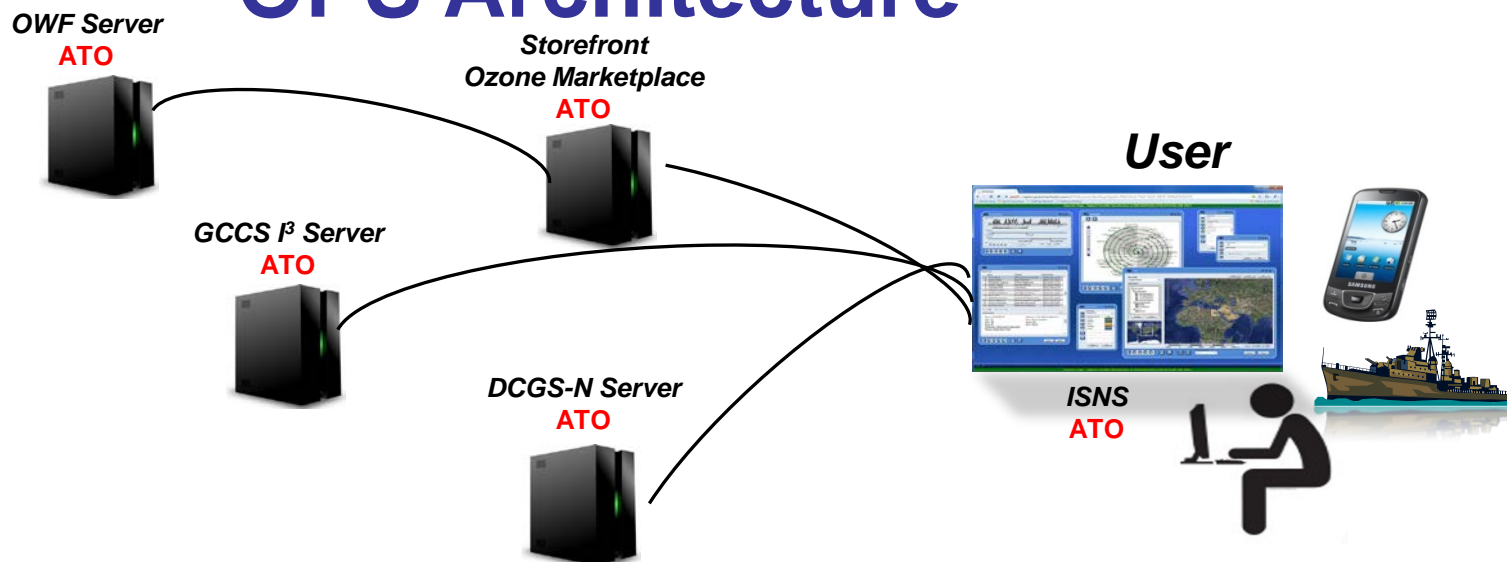
Proposed Widget Governance Process

SPAWAR — The Navy's Information Dominance Systems Command

Development
- Developers
- Development Repository SDK API Source Code

POR Sponsored Widgets

Entrance Criteria Prerequisites Source Code Documentation

Test & Integration Processes
- Widget A
- Trusted Environment

Exit Criteria Met: Widget Approved

Operational Repository Widget/Service Warehouse

Storefront
- Approved Widgets
- Widget A
- Trusted Environment

Warfighter Deployment

OPTEV / ODAA Approved Processes
- Integration Testing — P
- Acceptance — P
- IA — P
- Approval Board — P
- Functional Testing — P

- Metrics Collection — P
- Exposure — P
- Configuration Management — P

- Discovery — P
- Metrics Collection — P

PEO-C4I Storefront/Marketplace

PEO-C4I Storefront Widget Samples

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Conclusion

▼ **DOD must modify its acquisition philosophy to get new capabilities in the hands of the warfighter**

- Light weight mobile applications

- Access to services and data sources

- Streamlined processes for accredited PORs
  - Allows rapid fielding of associated Widgets

- PEO C4I Marketplace and accompanying Widget Governance Tool
  - Cost effective and expedient
  - Provides trusted and secure capabilities

▼ **The future of warfare is information dominance and speed to capability can provide the tactical or strategic advantage our warfighters need**

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Backup Slides

Problems with the Defense Acquisition System

Analysis of DOD Major Defense Acquisition Program Portfolios (fiscal year [FY] 2008 dollars)

	FY 2000 Portfolio	FY 2005 Portfolio	FY 2007 Portfolio
Portfolio size			
Number of programs	75	91	95
Total planned commitments	$790 Billion	$1.5 Trillion	$1.6 Trillion
Commitments outstanding	$380 Billion	$887 Billion	$858 Billion
Portfolio performance			
Change to total RDT&E costs from first estimate	27 percent	33 percent	40 percent
Change in total acquisition cost from first estimate	6 percent	18 percent	26 percent
Estimated total acquisition cost growth	$42 Billion	$202 Billion	$295 Billion
Share of programs with 25 percent or more increase in program acquisition unit cost	37 percent	44 percent	44 percent
Average schedule delay in delivering initial capabilities	16 months	17 months	21 months

Source: GAO analysis of DOD data.

Industry Approach

▼ The Apple App Store contains Apple-created applications and third-party mobile applications are available where they may be discovered and downloaded by the customer

- Apple's app approval process
  - Ensures submitted applications are reliable & perform properly
  - Adhere to Apple's requirements regarding appropriate content

- Developers are provided App Store Review Guidelines

- Upon submission for review
  - Applications are checked for compliance
    - Apps must comply with technical, content, and design criteria before they are made available in the App Store
  - Appeals of rejected applications are sent to an App Review Board

Industry Approach

▼ Developers of apps for Google's Android OS have two deployment options

- The Android App Section of Google Play (formerly Android Marketplace) and the Amazon Appstore

- Google Play does not monitor uploaded applications
  - It does place restrictions on application content, network usage, spam, and processing payments
  - If an application violates restrictions, Google can remove the application from Google Play

- Apps submitted to the Amazon Appstore are tested
  - Ensure that apps work as described in the product description
  - Do not impair the functionality of the user's mobile device
  - Comply with Appstore Distribution Agreement and content guidelines

Overview of Recommended Solution

▼ A DON/DOD widget T&I environment is needed that incorporates the unique and common aspects of Navy widget environments

- Will replicate the environment that connects directly to the Global Information Grid (GIG)

- Also replicate Navy, afloat, ashore, deployed and limited communication environments

  - Hardware, software, and associated configurations

- Creates a Navy trusted source environment for widget transition to the fleet

- Help to develop more effective and efficient techniques, processes, and procedures to achieve speed to capability

Overview of Recommended Solution

▼ Providing standards, specifications, processes, and a T&I environment will ensure proper products are discoverable by the warfighter

- Enable software based mission capabilities to be released in weeks rather than months or years

▼ A DOD marketplace or application store is also needed to rapidly and securely field software capabilities to the warfighter in the form of widgets and web applications

▼ Widgets provide a technological capability to foster this rapid fielding ability

- Widgets provide very specific functionality
- Generally require a relatively small amount of software code
- Created on a relatively short timeline

Widgets in Action – Widget Cookbook

Provide toolkit product documentation and recipes to help quickly design and implement widgets for the OWF.

Guidance Recipes

- Preface
- Ch. 1: The Widget Environment
- Ch. 2: User Experience
- Ch. 3: Widget Resources & Services
- Ch. 4: Inter-Widget Communication
- Ch. 5: Core Widgets & OWF Extensions
- Ch. 6: Security
- Ch. 7: Testing & Debugging
- Ch. 8: Performance
- Ch. 9: Packaging & Deployment
- Ch. 10: Marketplace
- Appendices

READMEs

- Documentation for relevant Toolkit products (e.g. core widgets).

Widgets in Action – Widget SDK Tools

Provide tools to help simplify, automate, and reduce duplication of effort in the build, package, and deploy process.

Scripts

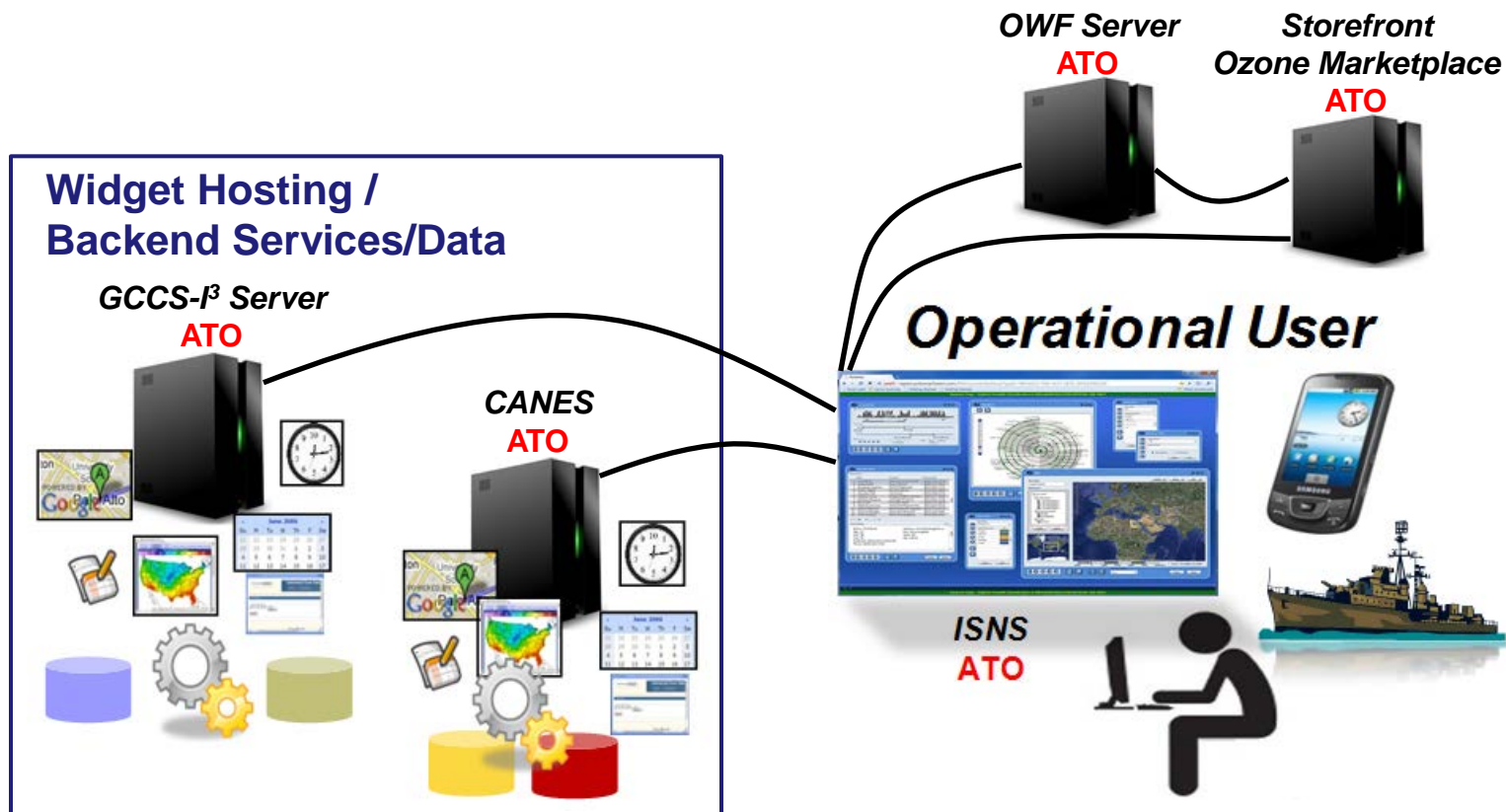– Tried and tested scripts to prepare and deploy widgets for use in the OWF.

Core Widgets

– Provide ready-to-go widgets that have common functionality and are used almost all of the time (e.g. map widget) along with instructions for use.
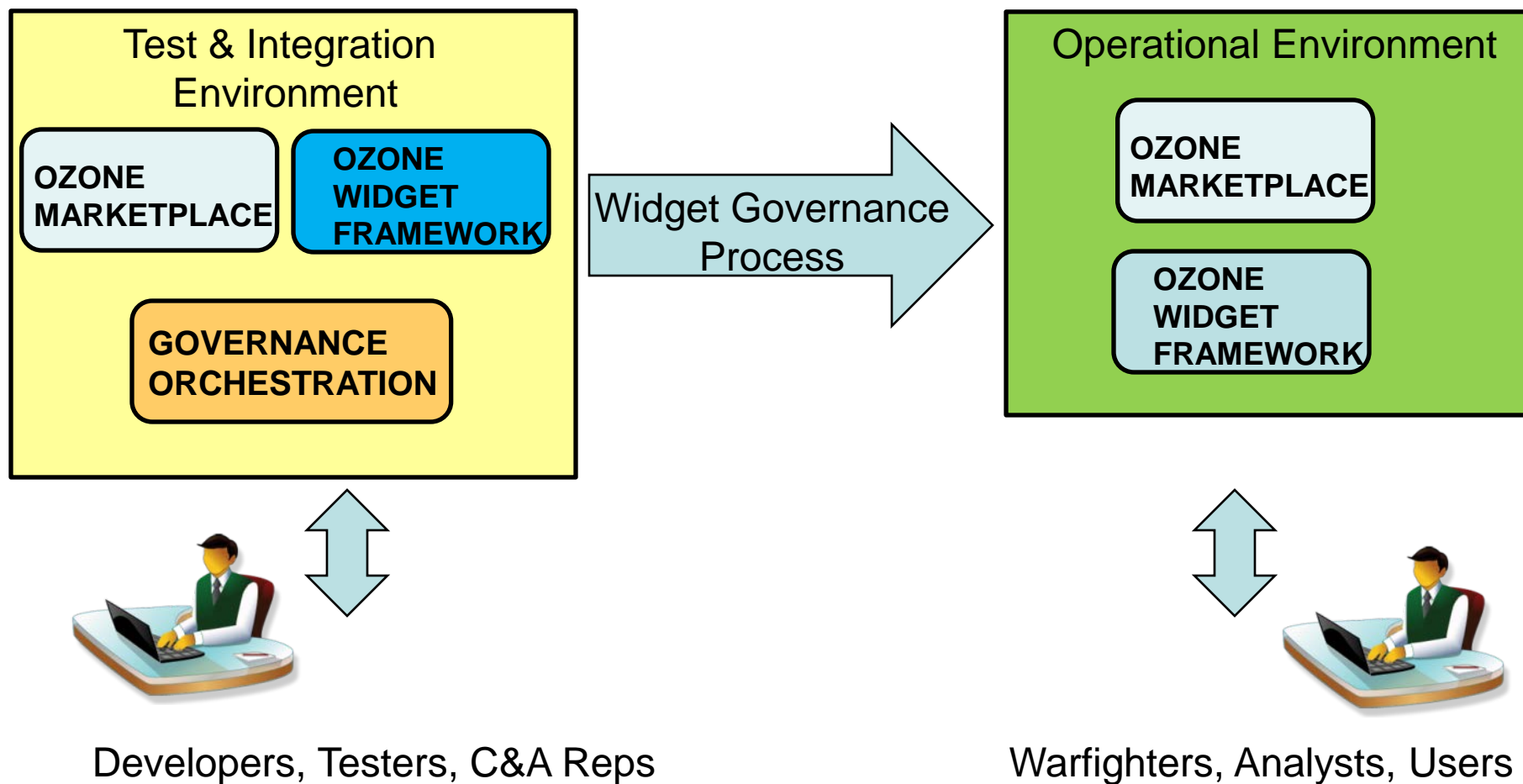
Widget Templates

– Provide a number of configurable widget templates for developers to fill-in-the-blanks and make their own.

Ozone Market Place

PEO C4I Storefront

Test & Integration Environment

- OZONE MARKETPLACE
- OZONE WIDGET FRAMEWORK
- GOVERNANCE ORCHESTRATION

Widget Governance Process

Operational Environment

- OZONE MARKETPLACE
- OZONE WIDGET FRAMEWORK

Developers, Testers, C&A Reps

Warfighters, Analysts, Users

Widget Governance Tool